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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Michele B. Kinrade et al.

Serial No.: 09/771956 Art Unit: 1647

Filed: January 29, 2001 Examiner: Sandra Wegert

For: CHIMERIC NEUROPEPTIDE Y RECEPTORS

Attorney Docket No.: U 013223-9

RESPONSE UNDER 37 CFR 1.116
- EXPEDITED PROCEDURE -
EXAMINING GROUP 1647

Assistant Commissioner for Patents
P. O. Box 1450
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RESPONSE TO OFFICE FINAL REJECTION DATED OCTOBER 29, 2003

This is in response to the final rejection of October 29, 2003. A check for $1280.00 and a notice of appeal are submitted herewith

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Date: April 27, 2004

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There are two issues outstanding in the present case, both relating to 35 USC 112 first paragraph, namely whether the written description and enablement requirements have been met. It is submitted that both requirements have been.

We will deal first with the written description issue. While *in re Wertheim* and *Gentry Gallery* were indeed cases where the subject matter differed significantly from chimeric receptor proteins, basic principles of patent law are the same irrespective of the technology involved. The principles to be derived from these cases are therefore applicable to the present application and require that 1) in any argument about whether the written description is adequate, the Examiner has the burden of showing that it is not and 2) when there is a broadly drafted claim, the test is whether it is fully supported by the description and drawings. These two principles are of major importance to a decision on the present application. The Examiner then goes on to state that even the biotech cases discussed in response to the previous action have different facts from the present application and so are distinguished. Again the Examiner seems to be trying to establish technology-specific variants of patent law. This is improper. While the fact of a case can indeed be relevant to determining the rationale used by the court to reach its decision, there simply cannot be one law for DNA and another for proteins as the Examiner seems to suggest in his comments on *Amgen v. Hoechst*.

The key issue, however, seems to be one on which the applicant and the Examiner agree namely whether, to paraphrase the *Vas Cath* case, the applicant has recounted the invention in such detail that it can be determined whether future claims are encompassed within the original creation. This is essentially the same issue as was set out in the quote from *Amgen Inc. v. Hoechst Marion Roussel* set out in the previous response namely

> The purpose of the written description requirement is to prevent an applicant from later asserting that he invented that which he did not; the applicant for a patent is therefore required to "recount the invention in such detail that his future claims can be determined to be encompassed within his original creation.

At heart, this is a fairness issue and goes to the question of whether, by making a broad postulate, an applicant has really contributed something to the art that should entitle him or her to broad patent protection or whether this is really just setting forth an idea with insufficient substance behind it that grant of a broad claim would have the effect of impeding rather than promoting the useful arts. The answer to this question is fact- specific. In technologies where there is a sound basis for prediction, there is a better case for granting broad claims on limited disclosure than in a case where disclosure of a broad idea contains insufficient substance to be a "creation" to use the language of *Vas Cath.* It is submitted that in the present case, the creation is sufficient to support the claims as presented. Simply because a claim encompasses embodiments that did not exist at its filing date does not in itself preclude a claim from complying with the written description requirement where the invention claimed is broad in concept and the newly invented embodiments are simply alternative ways of putting that broad concept into practice.

It is submitted that this is the case in the present application. The claims in dispute are directed to a combination of domains taken from NPY, NPY1 and NPY5 receptor proteins. Examples of all of these are known or described in the application. The domains are defined in terms of their locations in NPY, NPY1 and NPY5 receptors. There can be no question that the applicant was in possession of a clearly defined concept at the date of filing this application.

However, the PTO Guidelines on the written description refer to a requirement beyond that of possession and further state

> The claimed invention as a whole may not be adequately described if the claims require an essential or critical feature which is not adequately described in the specification and which is not conventional in the art or known to one of ordinary skill in the art. This problem may arise where an invention is described solely in terms of a method of its making coupled with its function and there is no described or art-recognized correlation or relationship between the structure of the invention and its function. A lack of adequate written description also arises if the knowledge and level of skill in the art would not permit one skilled in the art to immediately envisage the product claimed from the disclosed process.

Even this requirement, however, is met in the present case. Contrary to the Examiner's apparent assumption on page 5 of the final rejection, the applicant does not define its domains in functional terms but rather by their origin. Furthermore, such definition of the origin goes beyond the "recitation of a potential method" as discussed in *University of California v. Eli Lilly.* It is not true, as the Examiner states on page 4 of the final rejection, that one does not know what receptors fall within the scope of the claim. The nature of the receptor is defined by the location and origin of its component parts. .

The Examiner seems concerned about the fact that there are differences in Bmax and Kd values described with different receptors in the present application. The exact significance of this observation (which, as explained below, is in any case denied) to the issue of the written description requirement is not understood. Nor is the comment that "the receptor as defined does not describe a single genus". Even if true, this fact does not seem to be relevant to the question of whether there is an adequate written description. Indeed, even if different embodiments of the invention were to have different functions this would not be relevant to the question of whether the written description requirement has been met. The introductory portion of the present application describes the role of membrane spanning proteins to transnude signals into a cell and notes that chimeric proteins of this type are known. The present invention describes how to produce certain other chimeric proteins of this type by combining particular domains of known proteins. Exactly how such proteins function is irrelevant to this concept. It is true that for compliance with 35 USC 112 it is necessary to describe not only how to make but also how to use the claimed subject matter. The manner of operation of transmembrane proteins is described at page 3 lines 14 - 23. The Examiner has given no reason why the chimeric proteins of the present invention should not be used in the same way. As described below, some of the proteins of the present invention will have NPY1-like properties and others NPY-5-like properties. These differences in properties do not mean, however, that one skilled in the art will not know how to use them.

In view of the Examiner's comments on Kd and Bmax values, however, some comments on these seem appropriate. The Applicants advise that the differing values for Bmax recited in Table 1 on page 29 for receptors NPY5, IC3 (i.e a chimeric receptor falling within claim 1,

wherein the intracellular loop 3 of NPY1 has been inserted into NPY5) and CT (i.e. chimeric receptor falling within claim 4, wherein the C-terminal loop of NPY1 has been inserted into NPY5) are meaningless in the present context since they simply indicate the number of receptors expressed by the cells.

Secondly, the Applicants point out that the differences in actual numbers for Kd values shown in Table 1, are in reality, insignificant. One skilled in the art would require variations of the region of 30-fold before regarding the differences as significant when evaluating binding affinity between receptors. Thus one skilled in the art would regard all of Y5, IC3 and CT as having similar binding affinities based on the Kd values given.

It is true that Example 6, when read with Figure 1, shows there may be some functional differences in ligand binding between CT (which functions like NPY5) and IC3 (which functions like NPY1). One would expect that any replacement of a Y5 sequence with a Y1 sequence at the "end" C-terminal intracellular domain (as is the case with CT) would result on a more Y5 functional response and that replacement of a Y5 sequence with a Y1 sequence at the "internal" intracellular 3 loop would result in a more Y1- like response. This does not mean that the written description requirement has not been met. It is not necessary for all receptors within a structural definition to possess a single function for 35 USC 112 to be complied with.

Turning now to the enablement issue, the most recent case to address these issues was that of *Chiron Corporation v. Genentech, Inc* (Fed. Cir. 2004 Case 03-1158, -159, decided on March 30, 2004), a copy of which is enclosed for the Examiner's convenience. The issue before the court was whether the written description and enablement requirements of 35 USC 112 were met with respect to claims defining a monoclonal antibody in functional terms. Prior to trial, the claims had been construed to cover, inter alia, chimeric antibodies having the required function. In order to avoid anticipation, the plaintiffs had to establish that one of the parent applications in a chain of continuations and continuations-in-part provided the necessary written description and enablement. The only passage in that parent application on which the plaintiffs relied on stated

> As used herein the term "monclonal antibody" means an antibody composition having a homogeneous antibody population. It is not intended to be limited as regards the source of the antibody or the manner in which it is made.

The evidence showed that chimeric antibodies "first appeared as successful technology in the literature ... four months after the filing" of the relevant parent application.

In concluding that in such circumstances the enablement requirement had been met, the Federal Circuit based its decision on the non-existence of any chimeric antibody at the relevant date. This is not the present situation. The applicants have described specific embodiments and, as noted above, submit that the production of other embodiments is within the competence of those skilled in the art. In reaching its decision, the Federal Circuit made the following observations:

1. The ... application must enable one of ordinary skill in the art to practice "the full scope of the claimed invention." *In re Wright,* 999 F.2d 1557, 1561 (Fed. Cir. 1993).
2. That is not to say that the specification itself must necessarily describe how to make and use every possible variant of the claimed invention, for the artisan's knowledge of the prior art and routine experimentation can often fill gaps, interpolate between embodiments, and perhaps even extrapolate beyond the disclosed embodiments, depending upon the predictability of the art." *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1244 (Fed. Cir. 2003), and
3. The law does not expect an applicant to disclose knowledge invented or developed after the filing date. Such disclosure would be impossible. *In re Hogan*, 559 F.2d 595, 605-06 (CCPA 1977). Nascent technology, however, must be enabled with a "specific and useful teaching." *Genentech, Inc. v. Novo Nordisk, A/S*, 108 F.3d 1361, 1368 (Fed. Cir. 1997).

In addition to these observations we should also note the Wands factors relating to undue experimentation referred to by the examiner and considered in *Chiron v. Genentech*, although, as noted in *PPG Industries v. Guardian Indus. Corp* 75 F.3d 1558 (Fed. Cir. 1996), "the question of undue experimentation is a matter of degree. The fact that some experimentation is necessary does not preclude enablement; what is required is that the experimentation must not be unduly

extensive".

The first point to note is that the specification is addressed to one skilled in the art who is presumed to know and understand at least the prior art acknowledged in the present application. In considering the present issue, the Examiner seems to have ignored the fact that in seeking to put the present invention into practice, the skilled worker is not simply groping around in the dark. NPY receptors and in particular NPY1 and NPY5 receptors were known. Furthermore, the introductory portion of the specification describes how the boundaries between different domains in a protein can be determined and that the role of transmembrane proteins in signaling was known.

Applying the principles noted above to these facts, we find that: 1) there was already sufficient information known about transmembrane proteins for those skilled in the art to have a foundation on which to build so that the technology was not truly "nascent"; 2) the claimed proteins are defined by the origin of the components so that they are produceable, and 3) there was a sufficient body of information in existence as to how to use transmembrane proteins for those skilled in the art to be able to utilize the claimed products for their NPY5-like or NPY1-like properties as they chose. What the applicants did was to give them the means to do this by defining which domains of an NPY1 or NPY5 protein was to be replaced by a sequence from the other to achieve this objective. The Examiner provides no support for the assertion that undue experimentation would be required to determine the properties of any particular protein falling within the present claims and seems to imply that there can be an invention only if all claimed proteins share the same property. To some extent they all do - that of being able to act as a transmembrane signaling agent. The nature of the signal will depend on the precise structure. However, in view of the limited sources of the components of the protein and the known properties of the source materials, testing for particular activity should not be "undue".

The question of what constitutes undue experimentation was considered by the Federal Circuit in *In re Wands*. The factors to be considered were:

(1) the quantity of experimentation necessary: the examiner hypothesizes much but gives no real basis for this in view of the fact that there are only a limited number of receptors covered by the claims and the component parts come from known sources;

(2) the amount of direction or guidance provided: the specification describes the type of receptors and their typical uses;

(3) the presence or absence of working examples: these are provided

(4) the nature of the invention: a protein made up of known component domains;

(5) the state of the prior art: the invention is in a developing field but not one that is completely nascent;

(6) the relative skill of those in the art: high;

(7) the predictability or unpredictability of the art: becoming developed; and

(8) the breadth of the claims: relatively narrow.

Even applying the Wands factors therefore, it is submitted that the present specification provides one skilled in the art to produce and use the claimed receptors throughout the breadth of the claims.

It is therefore submitted that the enablement requirement has been met.

It is therefore submitted that the application is now in order for allowance and an early action this end is respectfully submitted.

Respectfully submitted,

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